

THE LIFE HISTORY AND HABITS OF EREMO-
CHRYSA PUNCTINERVIS McLACH
(Neuroptera).¹

BY ROGER C. SMITH, Kansas State Agricultural College.

Three adults, two males and a female of the rare Chrysopid, *Eremochrysa punctinervis* McLach., were taken July 3, 1925, in a narrow, weedy border between an alfalfa and a sorghum field on the Agronomy Farm of the Kansas Agricultural Experiment Station. An account of the life history and description of the stages has not been published for this species, nor for any species of this genus.

While Banks (1903) states that "it (this species) appears to be the most common species of the arid region of the southwest," Kansas is almost out of its range, for it is very rare in this state (Smith, 1925), judging from collections so far seen. A previous specimen was taken in April at Manhattan, by beating evergreens in the city cemetery. In fact, evergreens have been the generally accepted habitat of this species. However, these specimens were taken at least a half mile from the nearest evergreen and about one-fourth mile from the nearest tree. The plants in this border were sweet clover, alfalfa, shepherd's purse, red root (*Amaranthus*) and some wild grasses.

One of the three specimens was a gravid female, and during the night of July 3, deposited two eggs. These eggs were stalked, oblong oval in shape, light bluish green in color, with a white but quite inconspicuous micropyle. The length of the stalk of one of the eggs was 2.75 mm., length of egg 0.85 mm., diameter of egg 0.35 mm. The eggs, in so far as the writer observed, could not be distinguished from the eggs of any other small species of Chrysopid.

¹ Contribution No. 351 from the Entomological Laboratory, Kansas State Agricultural College. This paper embodies some of the results obtained in the prosecution of project No. 115 of the Agricultural Experiment Station. The writer wishes to acknowledge the assistance of Dr. Nathan Banks in determining these specimens, and of Mr. S. Fred Prince in preparing the illustrations.

The egg burster (Fig. 2) on the embryonic molt differed from that of all species yet seen in that the lobe was more pointed and extended at about a 45° angle instead of nearly horizontal. The irregularities, or teeth, on the ridge were quite obscure. The total length of the burster was 0.06 mm., the length of the lobe 0.024 mm.

Embryonic development required four days, since the larvae were observed resting on the egg shells the morning of July 7. They soon came down the stalks, however, and ran about hurriedly, apparently seeking food. When small aphids were offered the larvae, they refused to eat them, and it was thought that the proper food was not being offered them. It soon became apparent, however, that the larvae were searching primarily for packet materials to place on their backs, instead of for something to eat. In fact, they would not take food until they had found some suitable packet-forming materials and placed them on their backs. This was the first indication that the larvae were trash carriers, since the general morphology was that of the naked species. Their first packets were crude and scanty, for little suitable material was available. The instinct of trash carrying was more pronounced in this species than in any yet seen. This packet was a feature of each of the larval instars, that of the third being a typical, fully completed one. When even a portion of the packet was removed, the larvae became very restless and hurriedly sought materials to complete it.

The first molt occurred July 10, and the second molt July 14. They were mature on the 16th, and the larva saved spun its cocoon the 17th. One fully grown larva was killed for drawing and study.

The following is a brief description of the mature third instar larva of this species:

Larva, the typical trash carrier form (Smith, 1926) with shortened and humped abdomen (Fig. 1). Head of the usual Chrysopid shape, yellowish gray and somewhat translucent. Two narrow, purplish bands extended in convergent curves from antennae to the prothorax, between which was a light yellow or amber area; margins of bands somewhat irregular and bordered on each side with a prominent narrow area of gray. Exterior to these gray areas was another somewhat faint, irregular band of purplish red or lilac; jaws dark amber, translucent; antennae same at base but somewhat

smoky near middle and black at the tip; palpi also smoky at tip. Dorsum of thorax was gray or grayish amber, marked by two dorso-laterally purplish red bands which began as a continuation of the purple head bands and extended into the metathorax. They were darkest anteriorly and faded out gradually posteriorly. Dorsal vessel purplish red. Lateral tubercles were wholly grayish, translucent, and the stalks were short, resembling the non-trash-carriers. Setae on the tubercles were uncolored and evenly distributed on the tubercles. Rows of short hooked setae on each segment from the metathoracic to the sixth abdominal, inclusive; one, two or three rows to a segment, as illustrated; these setae were all colorless and bore prominent hooks apically which were all directed posteriorly. Legs uncolored, except tarsi black at tips. Width of head 0.5 mm., width of metathorax between apices of the tubercles 1.45 mm. Total length 4 mm.

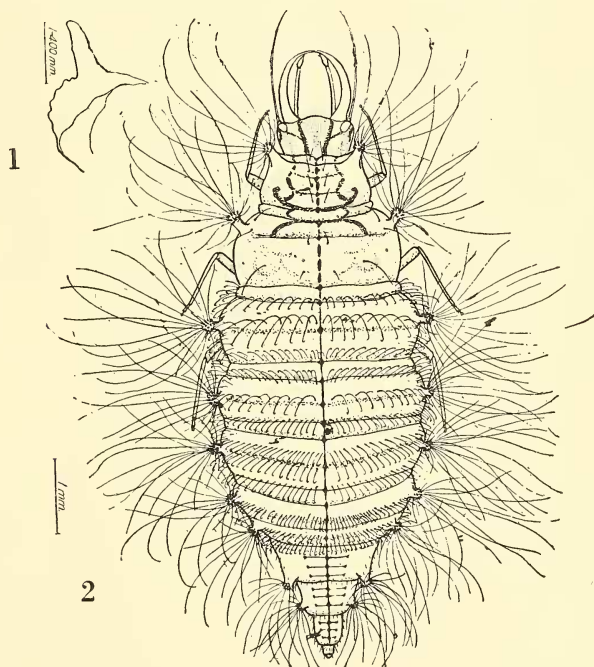
The second instar resembled the third in general morphology and coloration, except that the colored bands on the head and thorax were brownish red instead of purple. The head bands were arranged similar to those of the larvae of *Chrysopa quadripunctata*. They differed from this species in that a spur of brownish-red arose at the middle of each middle band and extended towards the bases of the antennae. There was a prominent mid-dorsal, faded, wine-colored or dark amber-colored irregular band from the head to end of the abdomen each side of the dorsal vessel. There was more color in this species than the writer has seen as yet in a trash-carrying species. The dorsal hooked setae on the body were relatively longer than in other species and more prominent. Total length of larva, 2.6 mm., width of head, 0.4 mm. The first instar had no distinctive color pattern until near the end of this stage, when that of the second instar began to appear.

In general, the color pattern differed from that of all other trash carriers seen. The head pattern reminded one somewhat of *C. plorabunda*, which is the most common species of this region, but the purple or lilac color is distinctive, likewise the gray border of each head band. The stalks of the tubercles were much shorter than those of other trash carriers, as, for example, *C. cockerelli*, and the setae from the thoracic tubercles were not arranged fan-shaped. There was a purplish-red color pattern on the dorsum of the thorax. Ordinarily there is no body color-

pattern in the trash carriers. The dorsal hooked setae were much longer and more prominent than those observed on any other trash carrier. They were readily seen even with low powers of magnification. In the other trash carriers, they were quite obscure and were early overlooked by the writer.

The larvae were reared upon aphids on sunflowers, since these plant lice happened to be plentiful at the time and the larvae readily fed upon them. The adults were given aphids also, but they were not observed to eat them. They accepted water and sweetened water, and drank freely on several occasions. This species, because of its rarity in eastern Kansas at least, is, of course, not an important factor in aphid control.

The cocoon did not differ from that of other small species of Chrysopids. It was almost perfectly spherical, 2.7 mm. in diameter. It was partially covered with aphid skins, bits of leaf fragments and some other unrecognizable materials. The larva saved spun its cocoon July 16, but it died in the pupal stage.



It is difficult to place this species definitely into any particular ecological group, since one specimen was taken on evergreens and these three on herbage in a cultivated field. The brownish coloration of the adult renders it quite well protected at least from the eye of man, either among the brown needles, cones and bud scales of pine, or on the dried vegetation of the prairie.

BIBLIOGRAPHY.

- Banks, Nathan.** A revision of the nearctic Chrysopidae. Trans. Amer. Ent. Soc., 1903. 29: 137-162. 1 pl.
- Smith, Roger C.** The trash-carrying habit of certain species of Chrysopidae (Neuroptera). Scientific Monthly, 1926. 21.
- Smith, Roger C.** The Neuroptera and Mecoptera of Kansas. Bul. Brooklyn Ent. Soc., 1925. 20: 165-171.

EXPLANATION OF FIGURES.

1. Egg burster of *Eremochrysa punctinervis*, greatly enlarged.
2. Dorsal view of a fully grown third instar larva of *E. punctinervis* with packet removed to show dorsal head pattern, lateral and curved dorsal setae.